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IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Applicants: Vaughan et al.

Application No: 10/824,174

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Title: Universal Microphone for Secure Radio Communication

Art Group: 2132

Examiner: Cordelia P. Kane

Confirmation No. 6357

Certificate of Mailing

I, Stephen Driscoll, certify that this reply was mailed properly to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on May 21, 2008.

Stephen J. Driscoll

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attention: Board of Patent Appeals and Interferences

APPELLANTS' BRIEF

This Appeal Brief is in furtherance of the Notice of Appeal filed in this case on January 21, 2008. Applicants also petition for a two-month extension of time, thereby extending the time for response through May 21, 2008. The Commissioner is authorized to charge the Appeal Brief fee, petition fee, and any other fee associated with this application to Deposit Account No. 50-4364.

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1. REAL PARTY IN INTEREST

The present application is assigned to **M/A-COM, Inc**. Accordingly, **M/A-COM, Inc.** is the **real** party in interest.

2. RELATED APPEALS AND INTERFERENCES

The Appellants, assignee, and the legal representatives of both are unaware of any other appeal or interference which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

3. STATUS OF CLAIMS

A. Claims canceled: 2, 4, 12

B. Claims withdrawn from consideration but not canceled: None

C. Claims pending: 1, 3, 5-11, 13 and 15-26

D. Claims allowed: none

E. Claims rejected: 1, 3, 5-11, 13 and 15-26

F. Claims appealed: 1, 3, 5-11, 13 and 15-26

Appealed claims 1, 3, 5-11, 13 and 15-26 as currently pending are attached as the Claims Appendix hereto.

4. STATUS OF AMENDMENTS

There are no un-entered amendments to the specification, claims or drawings in this case.

5. SUMMARY OF THE CLAIMED SUBJECT MATTER

Claim 1: A microphone unit for interfacing with a two way analog radio, said microphone unit comprising:

a microphone for receiving an audible input and converting said audible input into an analog electrical signal (page 5, lines 14-15; Fig. 2a, item 21);

a digitizer coupled to said microphone for creating a digital signal from said analog electrical signal (page 5, lines 17-21; Fig. 2a, item 25);

a voice coding device coupled to said digitizer for creating a voice coded signal from said digital signal (page 5, lines 22-24; Fig. 2a, item 27);

an encryption module coupled to receive said voice coding signal for encrypting said voice coded signal to generate an encrypted signal (page 6, line 10; Fig. 2a, item 29); and

a modulator coupled to receive said encrypted signal for generating an analog output signal capable of being received by a two way analog radio (page 7, lines 17-21; Fig. 2a, item 33); and

a cable operatively connected to said modulator and adapted for detachable connection to said two way analog radio to provide said analog output signal to said two way analog radio (page 4, lines 15-16, page 7, lines 22-24; Fig. 1, item 17).

Claim 11: A microphone unit for interfacing with a two way analog radio, said

microphone unit comprising:

a cable adapted for detachable connection to said two way analog radio to provide an encrypted analog signal from said two way analog radio to said microphone unit (page 4, lines 15-16, page 8, lines 9-12; Fig. 1, item 17);

a demodulator for receiving said encrypted analog signal from said analog radio and demodulating said signal into a digital voice coded signal (page 8, lines 12-15; Fig. 3a, item 37);

decryption means coupled to said demodulator for decrypting said voice coded signal to generate an decrypted voice coded signal (page 8, lines 16-24; Fig. 3a, item 39);

a voice decoding device coupled to said decryption means for generating a digital voice signal from said decrypted voice coded signal (page 9, lines 1-14; Fig. 3a, item 43); and

a digital to analog converter coupled to said voice decoding device for converting said digital voice signal to said analog electrical signal (page 9, lines 5-7; Fig. 3a, item 45); and

a speaker for converting said analog electrical signal to an audio signal (page 9, lines 8-9; Fig. 3a, item 49).

Claim 20: A method for providing a secure audio signal input to a two way analog radio, comprising the steps of:

providing a voice input to a microphone contained within a microphone unit to create an analog electrical signal (page 5, lines 14-15; Fig. 2a, item 21);

digitizing said analog electrical signal within said microphone unit to create a digital voice signal (page 5, lines 17-21; Fig. 2a, item 25);

voice coding said digital voice signal to create a voice coded signal (page 5, lines 22-24; Fig. 2a, item 27);

encrypting said voice coded signal to create an encrypted signal (page 6, line 10; Fig. 2a, item 29); and

modulating said encrypted signal to create an analog output signal (page 7, lines 17-21; Fig. 2a, item 33);

connecting the microphone unit to said two way analog radio using a detachable cable (page 4, lines 15-16, page 7, lines 22-24; Fig. 1, item 17);

providing the analog output signal to the two way analog radio via the cable (page 4, lines 15-16, page 7, lines 22-24; Fig. 1, item 17); and

wirelessly transmitting an analog output broadcast signal (page 8, lines 3-6; Fig. 2a, item 19).

Claim 22: A method for receiving a secure analog signal from a two way analog radio and converting said signal into audible speech, comprising the steps of:

connecting the microphone unit to an interface on said two way analog radio using a detachable cable (page 4, lines 15-16, page 8, lines 9-12; Fig. 1, item 17);

wirelessly receiving a secure analog broadcast signal (page 8, lines 3-6; Fig. 2a, item 19);

providing the secure analog signal from the two way analog radio via the cable (page 4, lines 15-16, page 8, lines 9-12; Fig. 1, item 17);

demodulating said secure analog signal from said analog radio to create an encrypted voice coded signal (page 8, lines 12-15; Fig. 3a, item 37);

decrypting said encrypted voice coded signal to create a digital voice coded signal (page 8, lines 16-24; Fig. 3a, item 39);

voice decoding said digital voice coded signal to create a decoded voice signal (page

9, lines 1-14; Fig. 3a, item 43);

converting said decoded voice signal to an analog voice signal (page 9, lines 5-7; Fig. 3a, item 45); and

converting said analog voice signal to an audio signal via a speaker (page 9, lines 8-9; Fig. 3a, item 49).

Claim 24: A method for secure communication among analog two way radios comprising the steps of:

providing a voice input to a microphone contained within a microphone unit to create an analog electrical signal (page 5, lines 14-15; Fig. 2a, item 21);

digitizing said analog electrical signal within said microphone unit to create a digital voice signal (page 5, lines 17-21; Fig. 2a, item 25);

voice coding said digital voice signal to create a voice coded signal (page 5, lines 22-24; Fig. 2a, item 27);

encrypting said voice coded signal to create an encrypted signal (page 6, line 10; Fig. 2a, item 29);

modulating said encrypted signal to create a first analog output signal, wherein said first analog output signal can be received by a two way radio via a microphone input contained within said radio (page 7, lines 17-21; Fig. 2a, item 33);

connecting the microphone unit to an interface on said first two way analog radio using a detachable cable (page 4, lines 15-16, page 7, lines 22-24; Fig. 1, item 17);

providing said analog output signal to a first two way analog radio via the cable (page 4, lines 15-16, page 7, lines 22-24; Fig. 1, item 17);

transmitting an analog broadcast signal by said first two way radio (page 8, lines 3-6;

Fig. 2a, item 19);

connecting a second microphone unit to an interface on said second two way analog radio using a second detachable cable (page 4, lines 15-16, page 8, lines 9-12; Fig. 1, item 17);

receiving said broadcast signal by a second two way radio and outputting a second analog output signal representative of said broadcast signal (page 8, lines 3-6; Fig. 2a, item 19);

providing said second analog output signal from the second two way analog radio to a second microphone unit via the second cable (page 4, lines 15-16, page 8, lines 9-12; Fig. 1, item 17);

demodulating said second output signal to create an encrypted voice coded signal (page 8, lines 12-15; Fig. 3a, item 37);

decrypting said encrypted voice coded signal to create a digital voice coded signal (page 8, lines 16-24; Fig. 3a, item 39);

voice decoding said digital voice coded signal to create a decoded voice signal (page 9, lines 1-14; Fig. 3a, item 43);

converting said decoded voice signal to an analog voice signal (page 9, lines 5-7; Fig. 3a, item 45); and

converting said analog voice signal to an audio signal via a speaker (page 9, lines 8-9; Fig. 3a, item 49).

The claimed invention relates to a microphone unit that interfaces with an existing two way analog radio to provide or receive encrypted messages from the radio. The

microphone unit is a separate unit from the radio that detachably connects to the two way radio via a detachable cable using common interface means (such as a plug/jack), thereby allowing existing two way radios to be used to transmit and received encrypted signals because the two units simply interface through the detachable cable that attaches to the existing interface of the radio. For this reason, the microphone unit is compatible with most types of existing two way radios.

The microphone unit functions to convert voice into encrypted analog signals, or, conversely convert encrypted analog signals to audio signals. Claim 1 relates to a microphone unit that converts voice to an encrypted analog signal for output to the two way radio via the detachable cable, while claim 11 relates to a microphone unit that receives an encrypted analog signal from the two way radio via the detachable cable and converts it to an audio signal. Amended independent Claims 20, 22 and 24 are method claims that recite similar language. Thus, one novel aspect of the claimed invention is that the microphone unit is connected to a two way radio using a detachable cable. Additionally, dependent claims 5 and 15 recite that the cable comprises a plug for connecting to a jack of said two way radio.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellants request the Board to review the following rejections:

A. Rejection of claims 1, 3, 5-7, 10, 11, 13, 15-17 and 20-26 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,150,401 to Ashby, III et al. ("Ashby") in view of U.S. Patent No. 4,134,070 to Henderson et al. ("Henderson").

B. Rejection of claims 8 and 18 under 35 U.S.C. 103(a) as being unpatentable over Ashby in view of Henderson, and further in view of U.S. Patent No. 6,131,084 to Hardwick ("Hardwick").

C. Rejection of claims 9 and 19 under 35 U.S.C. 103(a) as being unpatentable over Ashby in view of Henderson, and further in view of U.S. Patent No. 6,366,117 B1 to Pang et al. ("Pang").

7. ARGUMENT

1. Ashby in view of Henderson does not teach or suggest the claimed invention

a. The combination of Ashby and Henderson fails to disclose a microphone unit connected to a two way analog radio via a detachable cable

Applicants respectfully submit that the combination of Ashby and Henderson does not teach or suggest any of the claims of the present application. Claims 1 and 11 each recite a *microphone unit* for interfacing with a two way analog radio, said microphone unit comprising a cable adapted for *detachable connection* to said two way analog radio. Claims 20, 22 and 24 each recite connecting the microphone unit to said two way analog radio using a detachable cable. Each independent claim further recites that the microphone unit comprises a microphone, a digitizer, a voice coding device, an encryption module and a modulator. Additionally, dependent claims 5 and 15 of the present application recite that the cable comprises a plug for connecting to a jack of said two way analog radio. Therefore, the claims make clear that the microphone unit containing the encryption components is discrete from the radio unit, and connects to the radio unit via a detachable cable.

Ashby does not disclose a separate microphone unit containing encryption components that is connected to a two way analog radio via a detachable cable. *To the contrary,* Ashby discloses retrofitting an existing, conventional radio unit with encryption components by *integrating* a digitizer and encryption module, among other components, into the existing unit. (Abstract of Ashby, lines 2-4). Ashby specifically teaches wiring the encryption components to the inside of the radio. (Col. 7, ll. 4-8.) Therefore, Ashby does not disclose a discernable *microphone unit* containing encryption components that is connectable to a radio unit (as claimed), but rather a radio unit having integrated encryption components.

Even the combination of Ashby and Henderson fails to teach or suggest a separate microphone unit containing encryption components that is connected to a two way analog radio via a detachable cable. The Examiner states that Henderson discloses a radio with a detachable control plate, removable head and cable (column 3, lines 11-12) and that these are detached from a plug (column 5, lines 49-52). However, the cable of Henderson is not detachable. Rather, as clearly stated in column 3, lines 11-12 and illustrated in Figs. 6-9 of Henderson, the control plate is detachable and the head is removable; but the cable is not removable or detachable. The cable disclosed in column 3, line 12 of Henderson is the cable 34 shown in Figs. 6-9 which is attached at all times to the main body 21, the head 22, and the control plate 23 of the radio. Additionally, column 5, lines 49-52 of Henderson discloses only that four spring-plug openings 56 are employed as part of front surface 35 such that control plate 23 can be detached and reattached easily by the use of spring plugs 57. The spring plugs 57 of Henderson have nothing to do with the cable 34 of Henderson or any other cable or cable jack. Rather, the spring plugs 57 are simply mechanical elements that fasten

the head 22 to the main body 21. Thus, neither the spring plugs nor the cable of Henderson are the same as the detachable cable of the present invention.

The Examiner has mischaracterized the system of Ashby by asserting that it includes a microphone that is part of a microphone unit connected to a two way analog radio via a detachable cable. The language cited by the Examiner, column 5, lines 4-6 of Ashby, simply states that Ashby includes a conventional radio having a microphone capable of receiving the analog signals. A microphone inside a radio is not the same as a microphone inside a microphone unit that is separate from the radio. Nowhere does Ashby disclose a microphone that is part of a separate microphone unit that is connected to a radio via a detachable cable, as in the claimed invention.

Henderson also fails to disclose such a microphone unit. The detachable modules of Henderson do not include and signal processing components such as those in the microphone unit of the present invention. The head 22 and control plate 23 of Henderson appear to have control knobs, but nowhere does Henderson disclose that any type of signal processing takes place in either of these modules. Similarly, although a second embodiment of Henderson discloses a converter-indicator 82 is detachable from a main body portion 81 of an aviation radio 80 via a multipin connector 90, the converter-indicator 82 appears to simply be a display. Further, the modules of Henderson are all part of the same radio unit. Nowhere does Henderson disclose or suggest anything whatsoever to do with signal processing or any type of separate unit that interfaces with the radio, as in the claimed invention. Thus, there is no suggestion that it would be possible to have signal processing devices such as a digitizer, a voice coding device, and encrypting device and a modulator that are contained in a separate unit from a radio and are connected to the radio unit by only a detachable cable.

Therefore, the combination of Ashby and Henderson fails to disclose a encryption microphone unit that has a cable adapted for detachable connection to a two way analog radio.

b. The combination of Ashby and Henderson teaches away from an encryption microphone unit having a detachable cable for connection to an analog radio unit

Not only does the combination of Ashby and Henderson fail to disclose a encryption microphone unit having a cable for detachable connection to a two way analog radio unit (as claimed), but also there is no reason to modify the references in this way. *To the contrary*, Ashby actually *teaches* away from this approach. It is well established in patent law that the prior art must be considered as a whole including those portions that teach away from the claimed invention. Here, rather than disclosing a detachable cable as in the claimed invention, Ashby teaches wiring the cable inside the radio. This is the antithesis of a detachable cable.

Indeed, the retrofit approach taken by Ashby is precisely the approach that the present invention was aiming to avoid. Specifically, the background section of the patent application states in relevant part:

> A second, less commonly used option is to install a new component in existing radios to provide encryption. This approach also has significant limitations. Any currently existing encryption components have been designed for specific brands and models of radios. Thus, this retrofit approach is limited in the types of radios to which it can be applied. Furthermore, this approach is costly in that even after the encryption components have been purchased, each radio must be disassembled, the encryption components installed, and the radio reassembled.

P. 2, ll. 5-12. Therefore, as set forth in the present application, the retrofit approach used by Ashby, which involves the integration of specifically-designed components into an existing

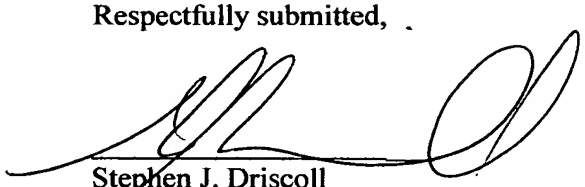
radio unit, is inconvenient and costly.

For this reason, modifying the modified two way radio of Ashby by the detachable display module of Henderson does not teach or suggest the claimed microphone unit of the present invention, which interfaces with the radio via a detachable cable and which comprises a digitizer, a voice coding device, an encrypting module and a modulator. Accordingly, each of the independent claims (1, 11, 20, 22 and 24), and all claims depending therefrom, patentably define over Ashby in view of Henderson.

8. CONCLUSION

The claimed invention is not taught or suggested by the prior art. Accordingly, the Examiner is respectfully requested to reconsider the pending claims. And early Notice of Allowance is earnestly solicited.

Respectfully submitted,



Stephen J. Driscoll
Saul Ewing LLP
1500 Market Street, Floor 38
Philadelphia, PA 19102
Telephone: 215-972-7872

CLAIMS APPENDIX

CLAIMS INVOLVED IN THIS APPEAL:

1. (Previously Presented) A microphone unit for interfacing with a two way analog radio, said microphone unit comprising:

a microphone for receiving an audible input and converting said audible input into an analog electrical signal;

a digitizer coupled to said microphone for creating a digital signal from said analog electrical signal;

a voice coding device coupled to said digitizer for creating a voice coded signal from said digital signal;

an encryption module coupled to receive said voice coding signal for encrypting said voice coded signal to generate an encrypted signal; and

a modulator coupled to receive said encrypted signal for generating an analog output signal capable of being received by a two way analog radio; and

a cable operatively connected to said modulator and adapted for detachable connection to said two way analog radio to provide said analog output signal to said two way analog radio.

2. (Canceled)

3. (Previously Presented) The microphone unit as set forth in claim 1, further comprising an amplifier circuit coupled between said microphone and said digitizer for amplifying said electrical signal and providing said amplified electrical signal to said digitizer.

4. (Canceled)

5. (Previously Presented) The microphone unit as set forth in claim 1, wherein said cable comprises a plug for connecting to a jack of said two way analog radio.

6. (Previously Presented) The microphone unit as set forth in claim 1, wherein said encryption module comprises software for encrypting said voice coded signal.

7. (Original) The microphone unit as set forth in claim 6, wherein said encryption module further comprises memory for storing an encryption key.

8. (Previously Presented) The microphone unit as set forth in claim 1, wherein said voice coding device is an AMBE+ vocoder.

9. (Original) The microphone unit as set forth in claim 1, wherein said encryption is AES encryption.

10. (Previously Presented) The microphone unit as set forth in claim 1, further comprising:

a demodulator for receiving an output analog signal from an analog radio and demodulating said signal into a voice coded signal;

decryption means coupled to said demodulator for decrypting said voice coded signal to generate a decrypted voice coded signal;

a voice decoding device coupled to said decryption means for generating a digital voice signal from said decrypted voice coded signal;

a digital to analog converter coupled to said voice decoding device for converting said digital voice signal to an analog voice signal; and

a speaker coupled to said digital to analog converter for outputting said analog voice signal.

11. (Previously Presented) A microphone unit for interfacing with a two way analog radio, said microphone unit comprising:

a cable adapted for detachable connection to said two way analog radio to provide an encrypted analog signal from said two way analog radio to said microphone unit;

a demodulator for receiving said encrypted analog signal from said analog radio and demodulating said signal into a digital voice coded signal;

decryption means coupled to said demodulator for decrypting said voice coded signal to generate an decrypted voice coded signal;

a voice decoding device coupled to said decryption means for generating a digital voice signal from said decrypted voice coded signal; and

a digital to analog converter coupled to said voice decoding device for converting said digital voice signal to said analog electrical signal; and

a speaker for converting said analog electrical signal to an audio signal.

12. (Canceled)

13. (Previously Presented) The microphone unit as set forth in claim 11, further

comprising an amplifier circuit coupled between said digital to analog converter and said speaker for amplifying said analog electrical signal and providing said amplified signal to said speaker.

14. (Canceled)

15. (Previously Presented) The microphone unit as set forth in claim 11, wherein said cable comprises a plug for connecting to a jack of said two way radio.

16. (Previously Presented) A microphone unit as set forth in claim 11, wherein said decryption module comprises software for decrypting said voice coded signal.

17. (Previously Presented) A microphone unit as set forth in claim 11, wherein said decryption module further comprises memory for storing an decryption key.

18. (Previously Presented) The microphone unit as set forth in claim 11, wherein said voice decoding device is an AMBE+ vocoder.

19. (Original) The microphone unit as set forth in claim 11, wherein said decryption is AES decryption.

20. (Previously Presented) A method for providing a secure audio signal input to a two way analog radio, comprising the steps of:

providing a voice input to a microphone contained within a microphone unit to create

an analog electrical signal;

digitizing said analog electrical signal within said microphone unit to create a digital voice signal;

voice coding said digital voice signal to create a voice coded signal;

encrypting said voice coded signal to create an encrypted signal; and

modulating said encrypted signal to create an analog output signal;

connecting the microphone unit to said two way analog radio using a detachable cable;

providing the analog output signal to the two way analog radio via the cable; and

wirelessly transmitting an analog output broadcast signal.

21. (Original) A method as set forth in claim 20, further comprising the step of:

amplifying said analog electrical signal before said digitizing step.

22. (Previously Presented) A method for receiving a secure analog signal from a two way analog radio and converting said signal into audible speech, comprising the steps of:

connecting the microphone unit to an interface on said two way analog radio using a detachable cable;

wirelessly receiving a secure analog broadcast signal.

providing the secure analog signal from the two way analog radio via the cable;

demodulating said secure analog signal from said analog radio to create an encrypted voice coded signal;

decrypting said encrypted voice coded signal to create a digital voice coded signal;

voice decoding said digital voice coded signal to create a decoded voice signal;

converting said decoded voice signal to an analog voice signal; and

converting said analog voice signal to an audio signal via a speaker.

23. (Original) A method as set forth in claim 18, further comprising the step of:

amplifying said analog voice signal prior to outputting via said speaker.

24. (Previously Presented) A method for secure communication among analog two way radios comprising the steps of:

providing a voice input to a microphone contained within a microphone unit to create an analog electrical signal;

digitizing said analog electrical signal within said microphone unit to create a digital voice signal;

voice coding said digital voice signal to create a voice coded signal;

encrypting said voice coded signal to create an encrypted signal;

modulating said encrypted signal to create a first analog output signal, wherein said first analog output signal can be received by a two way radio via a microphone input contained within said radio;

connecting the microphone unit to an interface on said first two way analog radio using a detachable cable;

providing said analog output signal to a first two way analog radio via the cable;

transmitting an analog broadcast signal by said first two way radio;

connecting a second microphone unit to an interface on said second two way analog radio using a second detachable cable;

receiving said broadcast signal by a second two way radio and outputting a second analog output signal representative of said broadcast signal;

providing said second analog output signal from the second two way analog radio to a second microphone unit via the second cable;

demodulating said second output signal to create an encrypted voice coded signal;

decrypting said encrypted voice coded signal to create a digital voice coded signal;

voice decoding said digital voice coded signal to create a decoded voice signal;

converting said decoded voice signal to an analog voice signal; and

converting said analog voice signal to an audio signal via a speaker.

25. (Previously Presented) The microphone unit as set forth in claim 1, further comprising said two way analog radio detachably connected to said cable.

26. (Previously Presented) The microphone unit as set forth in claim 11, further comprising said two way analog radio detachably connected to said cable.

EVIDENCE APPENDIX

No additional evidence is presented.

RELATED PROCEEDINGS APPENDIX

No related proceedings are presented.